

**BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, DC 20554**

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
	)	

To: The Commission

**REPLY COMMENTS OF PHILIPS ELECTRONICS  
NORTH AMERICA CORPORATION**

Philips Electronics North America Corporation ("Philips") submits these reply comments to address the comments filed in response to findings in two technical reports on initial measurement studies of two prototype TV White Space Devices ("WSDs") volunteered for testing by Philips and Microsoft.<sup>1</sup> The tests were designed and conducted by the Commission's Office of Engineering and Technology (OET) independent of the two companies that submitted the prototype devices. In addition to the two reports, the Commission also released Peer Review Reports and associated memoranda on each of its technical reports.<sup>2</sup>

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<sup>1</sup> See OET Report FCC/OET 07-TR-1006, Initial Evaluation of the Performance of Prototype TV-Band White Space Devices; and OET Report FCC/OET 07-TR-1005 ("White Space Report"), Direct-Pickup Interference Tests of Three Consumer Digital Television Receivers Available in 2005; both dated July 31, 2007, by the Technical Research Branch, Laboratory Division, Office of Engineering and Technology, Federal Communications Commission.

<sup>2</sup> See Peer Review Panel Report On OET Report FCC/OET 07-TR-1005, Direct-Pickup Interference Tests of Three Consumer Digital Television Receivers Available in 2005, dated July 18, 2007 (accompanied by related memoranda of various dates); and Peer Review Panel Report On OET Report FCC/OET 07-TR-1006, Initial Evaluation of the Performance of Prototype TV-Band White Space Devices, dated July 20, 2005 (accompanied by related memoranda of various dates) ("Peer Review Reports").

**I. THE COMMISSION SHOULD ESTABLISH TECHNICAL AND OPERATIONAL RULES FOR WSDS, AS THE COMMISSION'S PROTOTYPE TESTING HAS PROVED THEIR FEASIBILITY**

The Commission's ultimate goals for this proceeding are to enhance innovation and allow operations in the TV bands that will benefit a wide range of service providers and consumers by "improving the service range of wireless operations."<sup>3</sup> The Commission stated that:

Our goal in this proceeding is to allow such devices to operate on unused television channels in locations where such operations will not result in harmful interference to TV and other authorized services. We believe that this plan will provide for more efficient and effective use of the TV spectrum and will significantly benefit the public by allowing the development of new and innovative types of devices and services for businesses and consumers . . .<sup>4</sup>

Philips is wholeheartedly committed to helping the Commission reach these goals. Indeed, as noted in its Comments, Philips was a founding member of the Grand Alliance that pioneered the ATSC over-the-air DTV broadcast standard and worked closely with the Commission to facilitate its adoption, as well as being a leading manufacturer of digital television receivers and other consumer electronic products.<sup>5</sup> Thus, Philips has been instrumentally involved in the development of both DTVs and WSDs, and has a keen interest in the development and protection of both products. Philips is committed to working with the Commission to ensure that it establishes rules to allow these new and innovative devices to enter the marketplace – without subjecting DTV broadcast signals or wireless microphones to harmful interference.

However, one of the recurring themes of comments critical of the Prototypes submitted

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<sup>3</sup> See *In the Matter of Unlicensed Operation in the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, First Report and Order and Further Notice of Proposed Rule Making, 21 FCC Rcd 12266 at para. 1 (rel. Oct. 18, 2006) ("*FNPRM*").

<sup>4</sup> *Id.*

<sup>5</sup> See Comments of Philips at 2.

for testing in this proceeding is the contention that it would be impossible to achieve the Commission's goals of providing new and innovative services via WSDs while protecting existing DTV and wireless microphone operations from harmful interference. However, many of these comments give short thrift to the testing of the Philips prototype device, referred to as "Prototype B." Thus, these opposition claims ignore two critical facts: (1) The testing of Prototype B conclusively demonstrated that these devices can successfully be manufactured to prevent harmful interference. Indeed, the testing of Philips' Prototype B successfully demonstrated that WSDs can consistently and robustly detect DTV broadcast signals and wireless microphone signals, and thus are, in fact, able to protect DTV broadcast signals and wireless microphone signals from harmful interference; and (2) The submission of Philips' Prototype B was not for equipment authorization – which would allow for additional rigorous testing before any product would be provided to a consumer. Rather, the purpose was to test the feasibility of operating unlicensed WSDs without causing harmful interference – which was a clear success. Philips is committed to improving this early version of the device in order to be consistent with any reasonable rules that the Commission may adopt that are necessary to ensure protection of DTV broadcasts and wireless microphone operations from harmful interference.

As noted above, Philips is in a unique position, as a stakeholder in both the assurance that the DTV services are protected as well as a potential provider of WSDs, to bridge the gap between the naysayers and the progress-makers in this proceeding. Philips again applauds the FCC's Office of Engineering and Technology's expeditious and extensive testing of Prototype B. With this testing having been completed, the Commission now has sufficient information to develop technical and operational rules that will permit the deployment of portable devices in the TV white spaces while ensuring that no harmful interference occurs to DTV broadcast signals or

wireless microphone signals.

It is time for the Commission to develop and adopt rules so that devices can be designed, constructed, tested and authorized by the Commission in time to be manufactured and ready to market by February 19, 2009. As Philips noted in its Comments, “[o]nce appropriate technical rules are adopted, manufacturers can design, build and test complete consumer devices for the marketplace . . . [as] all such devices will have to demonstrate compliance with the Commission’s technical requirements during the equipment authorization process, so their operation in compliance with the FCC’s rules is assured.”<sup>6</sup>

While Philips believes that the testing of the Prototypes has demonstrated that the Commission can now proceed to the adoption of final rules, it takes this opportunity to clarify a number of issues set forth during the comment round in this proceeding.

**a. Prototype B Reliably Detected DTV Signals Down to – 114 dBm, Which is More than Sufficient to Protect Against Harmful Interference**

The Commission’s test results verified that the Philips Prototype B “reliably detect[ed] television channels occupied with DTV signals down to the specified level of -114 dBm.”<sup>7</sup> The Commission verified that Philips’ “Prototype B” device reliably detects DTV signals down to -114 dBm within a 6 MHz TV channel, even in the presence of a high power DTV signal in an adjacent channel.<sup>8</sup> Similarly, the Commission verified that the Philips’ “Prototype B” device reliably detects wireless microphones down to the -120 dBm level, well below the test’s specified -114 dBm threshold.<sup>9</sup> However, a number of commenters point out that the

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<sup>6</sup> See Comments of Philips at 5.

<sup>7</sup> See White Space Report at Section 6.1.2, p. 25

<sup>8</sup> See *id.*

<sup>9</sup> See *id.* at Section 7.2, p. 26.

Commission also noted that the detection reliability of Prototype B began to degrade below the -114 dBm threshold level.<sup>10</sup>

Consistent with Philips' belief that the proper detection threshold for TV band devices should be -114 dBm, Philips manufactured its Prototype B to meet this threshold. It passed the Commission's tests with flying colors at the requirement to which it was designed. Indeed, New America Foundation *et. al*, note that "no one has empirically established that this [-114 dBm] level of sensitivity is necessary to protect viewers from harmful interference. . . [and that] the typical DTV cannot display the signal [at -114 dBm]."<sup>11</sup> In addition, even though Prototype B was designed to meet a threshold of -114 dBm, Prototype B nevertheless reaches 95% detection at -116 dBm at two of the three channels tested.<sup>12</sup> This overall detection performance should continue to improve in future versions of the prototype. The Commission's testing of Prototype B provides sound indications that any reasonable and necessary requirements that the Commission sets will be met by manufacturers – as the feasibility of current technologies to detect and operate on TV white space channels without causing harmful interference was clearly established by the Commission's testing.

Lastly, MSTV/NAB argue that even the -116 dBm sensing threshold will not provide adequate protection to television services.<sup>13</sup> In doing so, MSTV/NAB clearly ignore the fact that the Commission "requested comment on whether to require that the sensing capability of devices using this approach be able to detect signals as low as -116 dBm, consistent with the *most*

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<sup>10</sup> See Comments of MSTV/NAB at 5; Comments of Shure Incorporated ("Shure") at 7.

<sup>11</sup> See Comments of New American Foundation, Media Access Project, Cuwin Foundation, Michael Marcus, Dr. Paul Kolodzy, and Dr. Joseph Evans at 3.

<sup>12</sup> See White Space Report at Figure 3.4. Philips is investigating the anomalous performance of Prototype B with respect to the detection of DTV signals at -116 dBm for the third channel.

<sup>13</sup> See Comments of MSTV/NAB at 6.

*conservative* threshold under consideration by IEEE 802.22.”<sup>14</sup> (emphasis added). The Commission should set its threshold at -114 dBm, which as noted above is more than sufficient for protecting DTV signals and wireless microphone signals.

**b. Geo-location is Not Necessary as a Mandated Requirement**

Motorola argues in its Comments that the Commission should actively pursue control channel and geo-location interference control mechanisms.<sup>15</sup> It bases its argument on the Commission’s conclusion that the sensing performance of Prototype B degraded below -114 dBm.<sup>16</sup> However, as demonstrated above, Philips specifically designed its Prototype B to meet a threshold of -114 dBm, and could design a device to meet a threshold of -116 dBm if necessary – demonstrating that contrary to Motorola’s claims, sensing technology *is* currently feasible. Sensing is a proven technology, as has been demonstrated extensively in this proceeding. In addition, geo-location is inadequate for the detection of wireless microphones, which are not licensed at particular locations and may be constantly appearing and disappearing. If particular manufacturers wish to implement this technology, at additional costs for each WSD, they should not be precluded from doing so – however, since the Commission’s testing demonstrated that sensing technology is ready for prime-time, it is more than capable of detecting harmful interference without the use of geo-location mechanisms.

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<sup>14</sup> See White Space Report at 8.

<sup>15</sup> See Comments of Motorola at 4.

<sup>16</sup> See *id* at 3-4.

**c. A Further Full System Test is Not Necessary and Sensing Times Will be Decreased Substantially**

A number of commenters criticize the fact that a transmitter was not used during the testing of the Philips' Prototype B, and that the processing time necessary to sense interference between particular channels was too long for a consumer device.<sup>17</sup>

When Prototype B conducts its initial sensing, it scans through the thirty possible channels for an open channel. This search includes an approximately 50 milliseconds per channel of capture time, that is followed by processing, for each of the thirty channels. This complete scan occurs before any transmitting occurs. Once this initial process is completed, Prototype B constantly scans the currently occupied channel, as well as continuously scans the other possible channels. Philips anticipates that once the prototype is refined and is manufactured as a consumer device for equipment authorization, the sensing time for this ongoing process will be well below a minute for all thirty channels -- even when transmitting. Thus, these results are completely transferable to a full system, making any further full system testing unnecessary.

**d. The "False Detect" Circumstance is Overinclusive, Not Underinclusive in Terms of Harmful Interference, and, In Any Event, Can Be Rectified**

Shure notes that Prototype B's detection process resulted in a number of "false detects," as the Commission found that in some instances Prototype B may falsely identify a wireless microphone signal in another channel and found in other instances that the device successfully detected a wireless microphone on a channel adjacent to one containing a strong DTV signal, but

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<sup>17</sup> See Comments of MSTV/NAB at 10; Comments of Shure at 8; Comments of Sprint Nextel Corporation at 2-3.

when scanning for any kind of signal, misidentified the type of signal.<sup>18</sup> Philips emphasizes that these instances do not pose any risk of harmful interference to broadcast or wireless microphone signals, only a reduction in the bandwidth available to the white space devices due to “false detects.” As noted in our prior comments, “a large number of these false detects occurred with high-power incumbent signals, whereas the prototype device submitted for testing was specifically designed to test the proposed rules of sensing incumbent signals at the very low signal levels of -114 dBm and below.”<sup>19</sup> This detection performance for high-power incumbents can be improved, with no loss of detection sensitivity at low power levels, and the necessary changes will be implemented in future versions of the prototype. As we have stated, “we emphasize that this is an early prototype, and the relevant parameters can be fine-tuned to minimize or eliminate “false detects” while still maintaining full detection capabilities.”<sup>20</sup> Lastly, it is important to note that by having these false detects, Prototype B did not demonstrate a possibility of causing harmful inference. Indeed, it was just the opposite - these “false detects” demonstrate over protection, not under protection.

## II. CONCLUSION

The Commission’s tests demonstrate the capability of WSDs to fully protect DTV broadcast and wireless microphone signals and provide a sound basis for beginning the task of drafting the technical and operational requirements for WSDs. Once appropriate technical rules are adopted, manufacturers, including Philips, can design, build and test complete consumer devices for the marketplace. By following this process, both a successful DTV transition and

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<sup>18</sup> See Comments of Shure at 5.

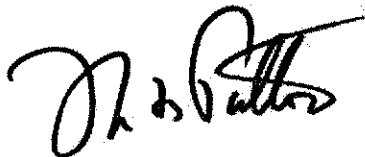
<sup>19</sup> See Comments of Philips at 4-5.

<sup>20</sup> See *id.*

successful deployment of WSDs can and should be achieved.

Respectfully submitted,

**PHILIPS ELECTRONICS NORTH AMERICA  
CORPORATION**

A handwritten signature in black ink, appearing to read 'T. B. Patton', written over a horizontal line.

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